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Molluscan Fauna of Wakayama Prefecture

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和歌山県の貝類相

和歌山県は紀伊半島の南西部、即ち東経 135°~136°01' 北緯 33°25'~34°22' にいたる地域に位置し古くから本邦屈指の貝類多産地として広く内外に知られている。これは地形的に南北に長いうえに黒潮（暖流）が近接するという恵まれた自然環境に起因する。本県の北部は中央構造線が横切り、その外帯は紀伊山地の山岳地帯から成り立っている。山脈には和泉、長峰、果無、大塔が走り、これらの山々の間をぬって北から紀の川、有田川、日高川、富田川、日置川、古座川、熊野川が海へ注いでいる。黒潮の影響で気候は一般に温暖、また雨量も多く、陸上はいたるところ照葉樹林 (Virgin forest) に被われている。海岸線は総延長 500 km に及ぶが、砂浜、岩石海岸など種々な海岸地形が発達する。海底地質については等深線の密な南部海域では岩礁海底が多く、ゆるやかな北部海域の紀伊水道では細砂泥からなっている。北赤道海流に端を発し北進する黒潮は紀伊半島沖で本邦に最も接岸したのち流速 3~4 ノット (1 ノット=時速 1852 m) で東流する。又黒潮は時として南下し紀伊半島の南端潮岬から遠く離れて流れることもあり、このような場合には熊野灘から遠州灘にかけて冷水塊が出現して沿岸の貝類相に重大な影響を及ぼすことがある。

1. 海産貝類 (Marine Shells)

本県の貝類分布は海底の地形、地質、海流、漁業形態から考察して凡そ次の三つの海域に区分することが出来る。

- A. 日の御崎 (Hinomisaki) 以北の北部海域
- B. 日の御崎から白浜番所崎 (Banshozaki) にいたる中部海域
- C. 番所崎以南から潮岬を経て新宮にいたる南部海域

尚このうち南部海域は最も広い範囲の海域であるが、潮岬を境にして東西海域の貝類に更に顕著な差異が見られる。中部海域の一部及び南部海域は主として岩礁海底で等深線が海岸線近くまで密である。さらに黒潮が岸を洗うためにイセエビ漁など沿岸漁業が盛んである。

これに対し北部海域、中部海域の一部は主に底棲魚族を中心とした漁業が盛んである。

A 北部海域の貝類

大阪湾の入口に位置する加太地区から日の御崎に至る海域である。過去には打上貝の多産する浜等が多くあったが、現在では開発が進み最も自然破壊の進んだ地域となった。

a. 和歌山市水軒浜 (Suiken-beach)

北部海域では最大の砂浜で古くから貝の産地として有名であったが現在は材木の貯木場となって砂浜は全く姿を止めない。ここではハマグリ (*Meretrix lusoria*)、ワスレガイ

(*Cyclosunetta mentrualis*), カガミガイ (*Dosinorbis japonica*), オオマテガイ (*Solen grandis*) 等の大型二枚貝が多産し, また台風時には多数の微小二枚貝, 巻貝が打上げられ約700種が採集された。珍種ウツセミガイ, (ミナワガイ) (*Akera soluta*) はここに多産した。

b. 有田市辰ヶ浜 (Tatsugahama beach)

北部海域随一の小型底曳船 (エビ漕ぎ網) の基地である。過去には好採集地であったが, 近年は漁屑を海上に捨てるので貝を採集することが出来ない。淡路島福良沖合より東南日の御崎までの海域水深 30~45m の泥砂底が主な操業海域であるが時として 90~150m の深度を曳く事もある。オオイトカケガイ (*Epitonium scalare*), ナガイトカケガイ (*Amacea magnifica*) などが得られた。

B 中部海域の貝類

日の御崎から白浜番所崎に至る海域で, 黒潮によって誘発される芸東流の影響のため亜熱帯性貝類が数多く採集されている。

a. 御坊市名田地区

イセエビ漁 (エビ刺網) が盛んな所で10月下旬より翌4月下旬迄操業される。その深度は大体 100m 内外迄であるが近年本地域を模式産地とする貝が数多く発表されている。ユリヤガイ (*Julia borbonica*), ウラシマイモ (*Rhizoconus urashimanus*), オトヒメイモ (*Endemoconus otohimeae*), トガリカセン (*Latiaxis cariferoides*) のほかイイジマフクロウニヤドリニナ (*Echineulima tokii*), ノコギリウニトウマキクリムシガイ (*Trochostilifer prinocidaricola*) 等 寄生性貝類やウミウサギ科 (Ovulidae) の貝類が多く記録されている。

b. 南部町^{みなべ}堀

中部海域では最大の漁港でエビ網漁に従事する船は約 100 隻以上を数える。その他少数の沖曳トロール船がある。名田地区の漁場は日の御崎と切目崎を結ぶ海域に限られているのに対し, この地区の漁場は日の御崎と市江崎を結ぶ線内の海域である。操業する深度も 150m 位迄とかなり深い。この海域から得られた主な貝類には次のようなものがある。オトメダカラ (*Schilderia hirasei*), ニッポンダカラ (*S. langfordi*), レンガマキイモ (*Rhizoconus kimioi*), クロチュウカフデ (*Cancilla melaniana*), ベニオビショコウラ (*Harpa harpa*), マンボウガイ (*Cypraecassis rufa*)。

当地区の沖曳トロール船は現在1隻のみ操業されていてテラマチダカラ (*Schilderia teramachii*), ホンカクジヒガイ (*Turbovula honkakujiana*) などが得られる。南部沖を模式産地とする貝類は隣接の田辺湾と共に極めて多くヤドリニナ科 (Stiliferidae), ハナゴウナ科 (Melanellidae), ウミウサギ科 (Ovulidae) 等の寄生性貝類が多い。

c. 田辺湾

中部海域では最大且唯一の内湾性貝類の多産地である。かつてはシロクサルボウガイ (ヒメアカガイ) (*Scapharea troscheli*), イオウハマグリ (*Pitar sulfureum*), ヒシガイ

(*Fragum bannoii*) が採集されたが現在は全く認められない。微小二枚貝を中心にこの湾を模式産地とする貝は極めて多い。タナベヤドリガイ (*Nipponomysella tanabensis*), タナベシヤクシガイダマシ (*Leiomys tanabensis*) を初めトゲモミデヒトデヤドリニナ (*Balcis astropectinicola*), ヒモイカリナマコツマミガイ (*Hypermastus lactea*) 等。

C 南部海域の貝類

白浜の番所崎から潮岬を経て、新宮に至る海域であるが最も海岸線が長く串本、潮岬周辺を除いて県内では最も調査のおくれている海域である。打上げ貝の採集地として古くからオコクダ浜、橋杭などが知られているが今は盛時の面影はない。しかし近年熱心な蒐集家によるドレッジ採集が行われつつあり、ベンテンイモ (*Leptoconus dusaveli*), コシダカオキナエビス (*Mikadotrochus schmalzi*) 等の珍種を始め県産未記録種が続々と採集されている。

また愛知県形原港を母港とする和歌山船籍の沖曳トロール船がこの海域ですばらしい成果をあげている。200 m～400 m の深度が主な漁場でユキノカサ (*Acmaea pallida*), キヘイジエビス (*Otukaia kiheiziebisu*) 等冷水系の貝が得られる事は注目すべき事実である。近年那智勝浦町字久井港の浚渫工事で多量の砂が打揚げられ可成り貴重な微小貝が採集された。

2. 淡水産貝類

本県は湖沼に乏しいので大型淡水種は極めて貧弱である。イシマキ (*Clithon retropictus*), カワニナ (*Semisulcospira libertina*), マルタニシ (*Cipangopaludina laeta*), ヤマトシジミ (*Corbicula japonica*) は普通に見られる。特産種としては県南部の山間溪流地に住むタニガワミジンナ (*Bythinella nipponica minatoi*), 紀ノ川支流和歌川にワカウラツボ (*Fairbankia sakaguchii*) がある。後者は環境の変化で幻の貝となっている。全般に県内淡水貝の調査は充分といえず今後の精査が望まれる。

3. 陸産貝類

山地が多くて温暖なため本県は陸産貝類の棲息環境としての好条件を備えている。県南部と県北部では可成りの分布の差異が見られ、概して県南部の方が固有種が多い。北部を代表する陸貝にはイトカゲギセル (*Stereophaedusa goniopoma*) がある。和歌山市から南は御坊市丸山まで分布する。

また田辺湾神島を模式産地とするコスジギセル (*Tyrannophaedusa plicilabris*) は主に県中部の山地に局限的に棲息する。太平洋広分布型のノミガイ (*Tornatellides boeningi*) は黒潮の影響を受ける神島にその分布が見られ、また高野山地には北方系のパツラマイマイ (*Discus pauper*) が棲息している。那智の滝を中心とする地域はよく自然が保たれており、本県の代表的陸貝ナチマイマイ (*Euhadra nachicola*), ツヤマイマイ (*Satsuma selasia*)

などが棲息する。本県の陸貝相でキセルガイ科 (Clausillidae) が多く棲息している事も大きい特徴でミツクリギセル (*Megalophaedusa martensii mitsukurii*), シリブトギセル (*Mundiphaedusa pachyspira*), クロズギセル (*M. kurozuensis*) など30余種が知られる。

(小山 安生)

Molluscan Fauna of Wakayama Prefecture

Wakayama Prefecture occupies the southwestern portion of the Kii Peninsula, and is extending from 135° to 136°01' East longitude and from 33°25' to 34°22' North latitude. From the earliest times the region has been prominent for its many varieties of shell species. The abundance of shell life in this region is due to its favorable environment—topographically, the coastline extends in a long band from north to south and is washed nearly directly by the Kuroshio Current near the south end or by other sea currents much affected by “Kuroshio” in the other parts.

The northern part of the prefecture is crossed by the central tectonic line and the adjoining portion of this line is covered by the Kii mountain range including the Izumi, Nagamine, Hatenashi and Ōto mountains, between which the rivers Kinokawa, Arida, Hidaka, Tonda, Hiki, Koza and Kumano, in the order from the north, are flowing and feeding into the sea. Due to the influence of the Kuroshio Current, the climate is generally temperate and as there is much rain, the land is covered with thick virgin forest. The coast extends for a distance of approximately 500 kilometers, and along it stretch sand beaches as well as craggy cliffs, giving it a varied appearance. The steeply sloping sea floor along the southern coast of the Kii Channel is furnished with many reefs, whereas the gently sloping sea bottom along the northern coast is covered generally with fine sandy mud. The Kuroshio Current originated in the North Equatorial Current and flowing northward, approaches Honshu Island most closely near the tip of the Kii Peninsula and then meanders east at a speed of three to four knots (one knot is equivalent to 1852 meters an hour). At times, the flow is further south, far off the southernmost point Shionomisaki and a cold water mass may intervene between it and the land. Such a cold water mass is generally stretching from the sea area of Enshu-nada to that of Kumano-nada, and the molluscan fauna along the coasts of the mentioned waters may be affected seriously by such a water mass of lower temperature.

1. Marine Shells

The distribution of marine shells in Wakayama Prefecture can be divided into three regions based on the topography and geology of the sea floor, sea currents and fishing operations.

a. The Northern Region—North of the Cape Hinomisaki

- b. The Middle Region—From Hinomisaki to the Cape Banshozaki in Shirahama
- c. The Southern Region—From Banshozaki south, past the Cape Shionomisaki, to Shingu.

Of these, the Southern Region covers the widest area, and further is divisible into the eastern and western areas by taking Shionomisaki as the borderline and remarkable differences can be observed between the molluscan faunas in respective areas. The coastal sea floor of some part of the Middle and all of the Southern Region is gradual at first, but soon drops suddenly, and the substratum is stony. Because of the strong effect of the Kuroshio Current, there is widespread fishing for such subtropical species as spiny lobsters. Compared with this, in the remaining part of the Middle Region, and the Northern Region, the major portion of the fishing industry depends on the demersal fishes.

A. Shells of the Northern Region

This region occupies the area from Kada near the entrance to Osaka Bay to Hinomisaki. In the past, there were many beaches where large numbers of shells were washed ashore, but now, due to the encroachments on the environment, the area has suffered the greatest natural destruction.

a. Beach of Suikenhama, Wakayama City

Suikenhama, the largest sand beach in the Northern Region, was long famous as a shell-producing region, but presently it is used as a timber storage area and the sand beach has completely disappeared. Here *Meretrix lusoria* (Hamaguri in Japanese), *Cyclosunetta mentrualis* (Wasuregai), *Dosinorbis japonicus* (Kagamigai), *Solen grandis* (Ômategai) and other large bivalve molluscs abound. During the typhoon season, many minute bivalves and snails are washed up and collected. Even the rare *Akera soluta* (Utsusemigai or Minawagai) could be found in large numbers in this area. Thus, as many as 700 species of shells have recorded from this beach.

b. Beach of Tatsugahama, Arita City

Tatsugahama is the major base of small dragnet vessels for prawn fishing. In the past, the beach was favored as a shell ground as the dredging nets were cleaned there. In recent years, however, the dumping of fish refuse is done on the sea and this has made the beach nearly free from any attractive shells. The main site of operations of these vessels is the area from Fukura on Awaji Island southeast to Hinomisaki, where the sea floor has a mud-sand mixture and the sea reaches depths of from 30 to 45 meters. In certain cases, dredging may take place in depths from 90 to 150 meters as well. Such significant species as *Epitonium scalare* (Ôitokakegai), *Amaea magnifica* (Nagaitokakegai), as well as a variety of others have been obtained from this sea area.

B. Shells of the Middle Region

A great number of subtropical molluscan species are collected in the area which

ranges from Hinomisaki to Banshozaki in Shirahama, due to the influence of the Geitō Current induced by "Kuroshio".

a. Nada District, Gobō City

Prawn fishing, by means of gillnets, is the major industry of this district. Operations take place from the end of October until the end of the following April and in the depths reaching approximately 100 meters. In recent years, this area has been recognized as the type locality for a considerable number of shells, such as a significant number of species of Family Ovulidae (*Umia* Umiusagi-ka), *Julia borbonica* (*Yuriyagai*) *Rhizoconus urashimanus* (*Urashimaimo*), *Endemoconus otohimeae* (*Otohimeimo*), *Latiaxis cariferoides* (*Togarikasen*) and parasitic shells represented by *Echineulima tokii* (*Iijimafukurouni-yadorinina*), *Trochostilifer prinocidaricola* (*Nokogiriunitomaki-kurimushigai*) and etc.

b. Sakai, Minabe-cho

As this is the largest fishing port in the Middle Region, more than a hundred ships engaged in prawn net fishing can be counted at rest in the harbor. Moreover, there are small numbers of trawlers which operate somewhat further out. Compared with the operations originating in the Nada District which encompass the area between Hinomisaki and Kirimezaki only, the operations from Sakai include the area within the line from Hinomisaki to Ichiezaki. Operations are conducted up to depths of 150 meters, which can be considered comparatively deep for such fishing. The following are the remarkable shells gathered here: *Schilderia hirasei* (*Otomedakara*), *S. langfordi* (*Nippondakara*), *Rhizoconus kimioi* (*Rengamakiimo*), *Cancilla melaniana* (*Kurochukafude*), *Harpa harpa* (*Beniobi-shokkoura*) and *Cypraeassis rufa* (*Mambogai*). Although small numbers of trawlers have been seen, at the present moment only one is actually in operation; *Schilderia teramachii* (*Teramachidakara*) and *Turbovula honkakujiana* (*Honkakujihigai*) were brought about by those trawlers. The sea area off Minabe, as well as adjoining Tanabe Bay, has been the type locality for so many shells that include a number of parasitic snails of Families Stiliferidae (*Yadorinina*-ka), Melanellidae (*Hanagouna*-ka) and Ovulidae (*Umiusagi*-ka).

c. Tanabe Bay

This is the largest bay in the Middle Region and the only area where the shells of inlet waters are harvested numerously. Formerly, *Scapharea troscheli* (*Shiroku sarubogai* or *Himeakagai*), *Pitar sulfureum* (*Iouhamaguri*) and *Fragum bannoi* (*Hishigai*) were obtainable, but presently, they are no longer to be found. The bay is the type locality for so many shells consisting mainly of minute bivalves *Nipponomysella tanabensis* (*Tanabeyadorigai*), *Leiomya tanabensis* (*Tanabe-shakushigaidamashi*), *Balcis astropectinicola* (*Togemomijihitode-yadorinina*) and *Hypermatius lactea* (*Himoikari-namako-tsumamigai*) are some representations of them.

C. Shells of the Southern Region

The Southern Region covers the area from Banshozaki in Shirahama to Shingu via Shionomisaki, and has the longest coast line. However, with the exceptions of the district of Kushimoto and Shionomisaki, investigations into the molluscan fauna are the least advanced of the three regions. Again as some beaches in the Northern Region, the beaches at Ogokuda and Hashigui have been famous for washing up of shells, but such areas are no longer what they were, because of some artificial modifications made on the neighboring coasts. Nevertheless, in very recent times, the most ambitious collectors have begun making use of dredging methods with the result that the rare species *Leptoconus dusaveli* (*Bentenimo*) and *Mikadotrochus schmalzi* (*Koshidaka-okinaebisu*), both unrecorded previously in this prefecture, have been discovered here. Furthermore, trawlers based in Katahara Bay, Aichi Prefecture, but registered with the Wakayama Bureau, have had excellent catches of shells in this region. It may be noted that fishing grounds ply with depths from 200 to 400 meters bring about cold water species such as *Acmaea pallida* (*Yukinokasa*) and *Otukaia kiheijebisu* (*Kiheijebisu*). In the past few years, the construction work to create a deep water port at Ugui, in Nachi Katsuura-cho, with its consequent turnover of large amounts of sand, has given rise to the discovery of important minute shells on the beach in this area.

2. Freshwater shells

Wakayama Prefecture has few lakes and marshlands, and therefore, large freshwater molluscs are comparatively few. Those which are ordinarily to be found include *Clithon retropictus* (*Ishimaki*), *Semisulcospira libertina* (*Kawanina*), *Cipango-paludina laeta* (*Marutanishi*) and *Corbicula japonica* (*Yamatoshijimi*). *Bythinella nipponica minatoi* (*Tanigawamijinnina*) is indigenous to the mountain streams in the southern part of the prefecture and *Fairbankia sakaguchii* (*Wakauratsubo*) has been indigenous to the river Wakagawa, a tributary of the River Kinokawa, but the latter is only known by name at present, having been destroyed by the changes in its environment. As examinations of the freshwater shells of Wakayama Prefecture are as yet incomplete, it is urged that more detailed reports will be forthcoming.

3. Terrestrial Shells

Wakayama Prefecture is favored with a suitable environment for terrestrial shell life, as the climate is warm and topography is mountainous. The species distribution differs between the northern and southern parts of the prefecture, and endemic species are richer in the latter than in the former. For example, *Stereophaedusa goniopoma* (*Itokakegiseru*) is characteristic of the north, typically found in the area from Wakayama City to the Maruyama district of Gobō City. The distribution of *Tyrannophaedusa plicilabris* (*Kosujigiseru*), of which the type locality is Kashima Islet in Tanabe Bay, is specifically localized in the mountain of the central portion of the prefecture. *Tornatellides boeningi* (*Nomigai*), with its wide distribution

throughout the districts along the Pacific coast of Japan affected by "Kuroshio", is also to be found at Kashima Islet. *Discus pauper* (*Patsuramaimai*), a northerly species, inhabits the Koya Mountains. The characteristic terrestrial molluscs of the prefecture are found in the area surrounding the Nachi Falls, as this area is one in which the natural environment is largely preserved. These include *Euhadra nachicola* (*Nachimaimai*) and *Satsuma selasia* (*Tsuyamaimai*). Wakayama prefecture is noteworthy for the large number of kinds belonging to Clausillidae (Kiserugai-ka), with over 30 species, most particularly *Megalophaedusa martensii mitsukurii* (*Mitsukurigiseru*), *Mundiphaedusa pachyspira* (*Shiributogiseru*) and *M. kurozuensis* (*Kurozugiseru*).
(Yasuo Koyama)